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10/576,254	03/09/2007	Jiro Naka	403688	3631
23548	7590	09/02/2010	EXAMINER	
LEYDIG VOIT & MAYER, LTD 700 THIRTEENTH ST. NW SUITE 300 WASHINGTON, DC 20005-3960				GAKH, YELENA G
1797		ART UNIT		PAPER NUMBER
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b>	<b>Applicant(s)</b>	
	10/576,254	NAKA ET AL.	
	<b>Examiner</b>	<b>Art Unit</b>	
	Yelena G. Gakh, Ph.D.	1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) Responsive to communication(s) filed on 17 April 2006.  
 2a) This action is FINAL.                    2b) This action is non-final.  
 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) Claim(s) 1-8 is/are pending in the application.  
 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
 5) Claim(s) \_\_\_\_\_ is/are allowed.  
 6) Claim(s) 1-8 is/are rejected.  
 7) Claim(s) \_\_\_\_\_ is/are objected to.  
 8) Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) The specification is objected to by the Examiner.  
 10) The drawing(s) filed on 17 April 2006 is/are: a) accepted or b) objected to by the Examiner.  
     Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
     Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
 a) All    b) Some \* c) None of:  
 1. Certified copies of the priority documents have been received.  
 2. Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | Paper No(s)/Mail Date. _____ .                                    |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date <u>04/17/06, 05/04/10</u> . | 5) <input type="checkbox"/> Notice of Informal Patent Application |
|   | 6) <input type="checkbox"/> Other: _____ .                        |

**DETAILED ACTION*****Specification***

1. The disclosure is objected to because of the following informalities: the specification appears to be a literal translation into English from a foreign document and is replete with grammatical and idiomatic errors. In particular, such phrase as "the minute quantity of the content" does not make such sense, since it is not clear, how the content can be in a minute quantity. The first paragraph of "Disclosure of the Invention" is difficult to understand. Further, the expression "dropping onto the sample table the solvent" is not correct either grammatically or technically. There is no such expression as "dropping a solvent". There is an expression "dispensing a solvent". Furthermore, the following expression "injecting the solvent into a gap between the sample table and the sample piece" seems to have the same meaning of dispensing the solvent onto the table. Otherwise, it is not clear, where the solvent is dispensed, and whether it is first dispensed, and then injected.

On page 15 the word microsyringe is misspelled.

Appropriate corrections are required.

2. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

The specification is objected to as not containing "a written description of the invention, .... , in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, ... to make and use the same".

In particular, it is not clear from the specification, how is it possible to measure the quantity of the additives in the polymer by contacting only a surface of the polymer piece with the solvent? If the additives are evenly spread through the bulk of the polymer sample, how is it possible to completely extract the additives from the sample by contacting only one surface of the sample with the solution? A complete extraction of the additives from the polymer is a separate task in the field, as can be clearly seen from the paper by Richter *et al.* "*Accelerated Solvent Extraction: A Technique for Sample Preparation*" (*Anal. Chem.*, 1996), Vandenburg *et al.* "*Analytical Extraction of Additives From Polymers*" (*Analyst*, 1997), or Vandenburg *et al.*, "*A*

*simple solvent selection method for accelerated solvent extraction of additives from polymers"* (*Analyst*, 1999). Furthermore, different solvents may extract different additives. From the specification it is not apparent, whether the Applicants applied any standard for obtaining quantitative results, since the correlation between the concentration of the additives and the peak areas of e.g. HPLC chromatogram provides a relative, rather than the absolute value. Thus, the quantitation of the additives does not seem to be possible with the method disclosed.

It is further unclear from the examples, how the additives, e.g. antioxidants are added to the polymers - are they kneaded into softened polymer? The disclosure is silent regarding details of preparing the samples. From the book by *Gnanou and Fontanille "Organic and Physical Chemistry of polymers"* (*Williey and Sons*, 2002) it follows that kneading takes place in softened polymer (see page 478). However the specification is silent regarding softening the polymer before kneading, and therefore it is not clear, whether the additive is evenly distributed in the bulk of the sample. Also, it is not clear, how and why the gap is formed between the sample piece and the table surface, if the sample is e.g. flat. Further, the specification discloses only examples of preliminary added a specific antioxidant in a known quantity to high density polyethylene and correlating the results to the added quantity - no experiment has been shown for determining an unknown quantity. The second example concerns added brominated flame retardant with the same unclear procedure regarding kneading the additive. Again it is not clear, which standard has been used for obtaining the absolute values of the retardant, since only a portion of the additive could have been extracted. At least, the completeness of the extraction has not been tested.

Furthermore, it appears that Applicants used specific size of the sample, specific amounts of the solvent, optimized the time for extraction, etc.

### ***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

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4. Claims 1-8 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claims recite "a method of analyzing a minute quantity of content by analyzing the content extracted with a solvent from a material including the content", while the specification discloses exclusively analysis of minor quantities of additives in polymers. Furthermore, the claims recite "dropping onto the sample table the solvent for extracting the content from the sample piece, and injecting the solvent into a gap between the sample table and the sample piece". First of all, "dropping onto the table the solvent" (which is incorrect expression anyway) seems to have the same sense as injecting the solvent into a gap between the sample table and the sample piece. Furthermore, the only time, when such gap can be formed is when the sample has grooves, which are shown on Figure 3. The specification does not disclose any embodiment for forming a gap between the flat table surface and a flat surface of the sample. The only embodiment that the specification discloses for forming such gap is when the sample has protrusions and recesses as demonstrated on Figure 3. Furthermore, the only two embodiments which disclose collecting the sample with extraction from the polymer is either by using the syringe, if HPLC is used, or directly introducing the vapors from the substrate into the analyzer when using X-ray fluorescence spectrometry, time-of-flight secondary ion mass spectrometry, infrared spectrometry, and X-ray photoelectron spectroscopy (page 13). No other embodiments are disclosed in the specification.

The examiner respectfully reminds the Applicants that according to MPEP §2163:

**"2163.02. Standard for Determining Compliance with Written Description Requirement:**

The courts have described the essential question to be addressed in a description requirement issue in a variety of ways. An objective standard for determining compliance with the written description requirement is, "does the description clearly allow persons of ordinary skill in the art to recognize that he or she invented what is claimed." *In re Gosteli*, 872 F.2d 1008, 1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989). Under *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991), to satisfy the written description requirement, an applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention, and that the invention, in that context, is whatever is now claimed. The test for sufficiency of support in a parent application is whether the disclosure of the application relied upon "reasonably conveys to the artisan that the inventor had

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possession at that time of the later claimed subject matter." *Ralston Purina Co. v. Far-Mar-Co., Inc.*, 772 F.2d 1570, 1575, 227 USPQ 177, 179 (Fed. Cir. 1985) (quoting *In re Kaslow*, 707 F.2d 1366, 1375, 217 USPQ 1089, 1096 (Fed. Cir. 1983)). Whenever the issue arises, the fundamental factual inquiry is whether the specification conveys with reasonable clarity to those skilled in the art that, as of the filing date sought, applicant was in possession of the invention as now claimed. See, e.g., *Vas-Cath, Inc. v. Mahurkar*, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991). An applicant shows possession of the claimed invention by describing the claimed invention with all of its limitations using such descriptive means as words, structures, figures, diagrams, and formulas that fully set forth the claimed invention. *Lockwood v. American Airlines, Inc.*, 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997). Possession may be shown in a variety of ways including description of an actual reduction to practice, or by showing that the invention was "ready for patenting" such as by the disclosure of drawings or structural chemical formulas that show that the invention was complete, or by describing distinguishing identifying characteristics sufficient to show that the applicant was in possession of the claimed invention. See, e.g., *Pfaff v. Wells Elecs., Inc.*, 525 U.S. 55, 68, 119 S.Ct. 304, 312, 48 USPQ2d 1641, 1647 (1998); *Regents of the University of California v. Eli Lilly*, 119 F.3d 1559, 1568, 43 USPQ2d 1398, 1406 (Fed. Cir. 1997); *Amgen, Inc. v. Chugai Pharmaceutical*, 927 F.2d 1200, 1206, 18 USPQ2d 1016, 1021 (Fed. Cir. 1991) (one must define a compound by "whatever characteristics sufficiently distinguish it").

Thus, the Applicants did not show "possession of the claimed invention by describing the claimed invention with all of its limitations using such descriptive means as words, structures, figures, diagrams, and formulas that fully set forth the claimed invention."

5. Claims 1-8 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the method of quantitative analysis of additives in polymers by extracting additives from a relatively small sample of the polymer, does not reasonably provide enablement for any quantitative analysis of any content in any other sample. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. The specification discloses exclusively extracting additives from the polymers by solvent extraction from the small sample without testing completeness of extraction. No other materials or other sizes of the sample are disclosed for analyzing by such method. Since it does not appear that the completeness of the extraction has been tested, and since no standard with the known amount of the additive has been used, the specification does not provide any proof for *quantitative* analysis of the analysis. It would have been an undue experimentation for a person of ordinary skill in the art to apply the claimed method in the scope of the claims.

***The Breath of the Claims and  
the Nature of the Invention***

The claims recite very broadly a method for analyzing a minute quantity of the content of the material, while the specification specifically discloses analysis of additives in polymers. Furthermore, the specification does not provide any evidence for quantitative analysis of additives in the bulk of the polymer.

***The State of the Prior Art and  
the Level of Predictability in the Art***

The prior art teaches that complete extraction of the additives from polymers within a reasonable time frame is a special problem in the art, see *Richter et al. "Accelerated Solvent Extraction: A Technique for Sample Preparation"* (*Anal. Chem.*, 1996):

"Sample extraction procedures are often perceived as bottlenecks in analytical methods. In the last few years, various attempts have been made to replace classical extraction techniques (for example, automated Soxhlet extraction,<sup>1,2</sup> microwave dissolution, <sup>3-6</sup> sonication extraction,<sup>7-9</sup> and supercritical fluid extraction.<sup>10-12</sup> ). Each technique reduces the volume of extraction solvent required and shortens the sample preparation time as compared to Soxhlet extraction." (Page 1033, left column),

*Vandenburg et al. "Analytical Extraction of Additives From Polymers"* (*Analyst*, 1997):

"Here the analyte is extracted from the solid medium by a liquid, which is separated by physical means, such as filtration. There are many methods for carrying out these extractions including Soxhlet, sonication and shake-flask extractions. Spell and Eddy<sup>17</sup> studied the extraction of additives from PP at room temperature and found that required extraction time varied linearly with polymer density and decreased with increasing particle size. They also found a large variation in extraction time for different solvents and additives. By powdering the polymer to 50 mesh size, 98% extraction of 2,6-di-tert-butyl-4-methylphenol (BHT) was achieved by shaking at room temperature for 30 min with carbon disulfide. To achieve the same recovery with isoctane required 125 min, and 2000 min were required to recover Santonox with isoctane. *The importance of small particles is further demonstrated by Newton.*<sup>14</sup> Refluxing ground PP with chloroform for 1 h gives complete extraction. *For films, 3 h are required and for unground granules 3 h are sufficient to provide an extract for identification purposes only.* Ethoxylated tertiary amines can be extracted from PP by refluxing the ground material with 1,2-dichloroethane for 1 h. Refluxing the granules for 3 h gives only 85% extraction." (Page 102R, left column),

or

*Vandenburg et al., "A simple solvent selection method for accelerated solvent extraction of additives from polymers"* (*Analyst*, 1999):

"The additive content of polymers needs to be known for quality and regulatory reasons. The additive is usually extracted from the polymer before analysis. Traditional methods such as

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Soxhlet extraction, boiling under reflux or dissolution of the polymer followed by re-precipitation, are often very time consuming and can use large amounts of solvents. These techniques are also difficult to automate. There are several new techniques of extraction which have been applied, most widely to environmental samples, resulting in reduced extraction time and solvent usage. These are supercritical fluid extraction (SFE), microwave assisted extraction (MAE) and accelerated solvent extraction (ASE®), which have been described in recent articles.<sup>1-3</sup> Of these techniques, SFE has been available the longest and has been most widely applied to polymers, resulting in rapid extractions, summarised in a recent review.<sup>4</sup> However, there are indications that use of normal liquid solvents can improve on the extraction rates achieved by SFE.<sup>5"</sup> (page 1707, left column).

The prior art does not predict any success for complete extraction of the additives from the materials by contacting the solvent with the surface of the material sample according to the claims.

***The Existence of Working Examples***

The Applicants provided specific examples for analysis of specific additives added in known amounts to the polymer samples of a specific small size and using the method of extracting the additives by contacting the surface of the sample with the known amount of the solvent. Furthermore, while the Applicants found linear correlation of the analytical data and the relative concentration of the additives, it appears that there is no confirmation of the absolute values of the concentrations, since no standard has been used, and no tests for completeness of the extraction have been provided.

***The Quantity of Experimentation Needed  
to Make or Use the Invention Based on the Content of the Disclosure***

It would have been an undue experimentation for a person of ordinary skill in the art to perform the method in the scope of the claims.

Claim 8 is separately rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for the method of measuring brominated flame retardant in the polymer, does not reasonably provide enablement for any other additive in any other sample. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to practice the invention commensurate in scope with these claims. The specification discloses improving extraction efficiency of brominated flame retardant by using silver salts in the solvent. This is caused by forming a complex between brominated compound and silver, as it is well known that silver salts, such as nitrate, react with halogen

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compounds to form  $\text{Ag}^+\text{Hal}^-$ . No other additives have been shown to be extracted using silver salts. It would have been an undue experimentation for a person of ordinary skill in the art to search for other components in the material to be extracted using silver salts in the solvent.

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. The claims recite "a method of analyzing a minute quantity of content by analyzing the content extracted with a solvent from a material including the content". This preamble does not make much sense. It is not clear, what is "a minute quantity of the content". The content of what? Also, the content of a material is its whole content. How can it be in a minute quantity? Furthermore, it is not clear, what type of material is meant in the claim, and what can be extracted from such material by the solvent? Besides unclarity of the claims, the claims are indefinite. The Applicants are respectfully referred to the following excerpt from MPEP:

**"§2171 Two Separate Requirements for Claims Under 35 U.S.C. 112, Second Paragraph:**

The second paragraph of 35 U.S.C. 112 is directed to requirements for the claims: The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

There are two separate requirements set forth in this paragraph:

- (A) the claims must set forth the subject matter that applicants regard as their invention; and
- (B) the claims must particularly point out and distinctly define the metes and bounds of the subject matter that will be protected by the patent grant.

The first requirement is a subjective one because it is dependent on what the applicants for a patent regard as their invention. The second requirement is an objective one because it is not dependent on the views of applicant or any particular individual, but is evaluated in the context of whether the claim is definite - i.e., whether the scope of the claim is clear to a hypothetical person possessing the ordinary level of skill in the pertinent art.

Although an essential purpose of the examination process is to determine whether or not the claims define an invention that is both novel and nonobvious over the prior art, another essential purpose of patent examination is to determine whether or not the claims

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are precise, clear, correct, and unambiguous. The uncertainties of claim scope should be removed, as much as possible, during the examination process.

The inquiry during examination is patentability of the invention as applicant regards it. If the claims do not particularly point out and distinctly claim that which applicants regard as their invention, the appropriate action by the examiner is to reject the claims under 35 U.S.C. 112, second paragraph. *In re Zletz*, 893 F.2d 319, 13 USPQ2d 1320 (Fed. Cir. 1989). If a rejection is based on 35 U.S.C. 112, second paragraph, the examiner should further explain whether the rejection is based on indefiniteness or on the failure to claim what applicants regard as their invention. *Ex parte Ionescu*, 222 USPQ 537, 539 Bd. App. 1984)"

Furthermore:

**"§2172 Subject Matter Which Applicants Regard as Their Invention:**

If the language of the claim is such that a person of ordinary skill in the art could not interpret the metes and bounds of the claim so as to understand how to avoid infringement, a rejection of the claim under 35 U.S.C. 112, second paragraph, would be appropriate. See *Morton Int'l, Inc. v. Cardinal Chem. Co.*, 5 F.3d 1464, 1470, 28 USPQ2d 1190, 1195 (Fed. Cir. 1993)."

In the instant case "the language of the claim is such that a person of ordinary skill in the art could not interpret the metes and bounds of the claim so as to understand how to avoid infringement".

Further, in second step two sub-steps are recited: "dropping onto the sample table the solvent" and "injecting the solvent into a gap between the sample table and the sample piece". The first sub-step is not clear either grammatically or technically. First, there is no such expression as "dropping the solvent". The proper term would be "dispensing". Second, it is totally unclear, as to where the solvent is dispensed onto the table, and whether injecting the solvent into the gap is the next step. According to the specification, the solvent is injected into the gap between the sample and the table, when the sample has gaps formed by grooves. There is not separate step of "dropping the solvent" onto the table. Clarification is required.

It is not clear, whether the sample should be of a specific size in relation to the amount of the solvent in order to achieve completeness of the extraction.

It is also not clear, whether the gap is specially formed so that the solvent could be injected there.

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8. Claims 1-8 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential steps, such omission amounting to a gap between the steps. See MPEP § 2172.01. The omitted steps are: collecting the extract from the table for further analysis.

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. **Claims 1, 2, 4, 6 and 7** are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-077158 A (Abstract, IDS).

JP 2001-077158 discloses: "A surface of a wafer 1 is dipped in a diluted aqua region 3 made of aqua region diluted in pure water for a given time, and the diluted aqua region 3 is

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recollected. The aqua region 3 is vaporized to dried, solidified, and resolved in a nitric acid. Then, the metallic contamination on the surface of the silicon wafer 1 is analyzed by inductively coupled plasma mass spectrometry (ICP-MS) or atom absorption spectrometry (AAS)" (Abstract). This disclosure makes it obvious to perform the steps of injecting the solvent under the sample surface to cover the sample surface, extract the additives and analyze them using secondary mass spectrometry. It would have been obvious for a person of ordinary skill in the art to shake (vibrate) the apparatus in order to accelerate extraction of the additives from the sample into the solvent (*Claim 6*).

13. **Claim 3** is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-077158 A in view of the prior art indicated by Carrott et al. (Analyst, 1998) (Carrott).

While JP 2001-077158 does not specifically disclose HPLC analysis of the extract, Carrott indicates: "Direct analysis of additives in the polymer matrix is difficult owing to the small amounts present (often in the ppm range), and chromatographic analysis of polymer extracts is therefore commonly employed. As additives generally have high molecular masses, HPLC has been the most widely used method for analysis of the additives." Therefore, it would have been obvious for a person of ordinary skill in the art to use HPLC, which is indicated by Carrott as conventional analysis technique for extracts comprising polymer additives, in method disclosed in JP 2001-077158.

14. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over JP 2001-077158 A in view of Médard et al. (Surface and Interface Analysis, 2002) (Médard).

While JP 2001-077158 does not specifically disclose time-of-flight secondary mass spectrometry (ToF-SIMS) for analysis of the additives in the polymer, Médard discloses "Characterization of additives at polymer surfaces by ToF-SIMS" (Title):

"In order to test the possibility of additive concentration quantification based on SIMS data, model samples were prepared. Samples consisted of thin polymer layers deposited by spin coating from solutions containing controlled amounts of selected additives. After identification of the main characteristic additive peaks, the SIMS intensity measured on these samples was compared with the bulk additive concentration. Our results showed that for the Irgafos 168–Hostavin N30 mixtures a linear relationship was found between SIMS intensity ratio and bulk composition. Thus, no synergy effect was detected when these additives are mixed together. However, for Irgafos 168 in copolymer PETi no linearity was observed. The data, based either on relative intensity or on multivariate statistical analysis (principal component analysis), indicated a strong segregation of the additive at the surface, i.e. a possible synergy effect with the polymer matrix. Finally, it appears that the segregation effect depended greatly on the nature of the additive and

the polymer because, for the same bulk concentration, copper phthalocyanine in PETi and Irgafos 168 or Irganox 1010 in atactic polypropylene were barely detected." (Abstract).

It would have been obvious for a person of ordinary skill in the art to apply ToF-SIMS instead of ICP-MS in the method disclosed in JP 2001-077158, because it is shown to give reliable results for quantifying some additives in the bulk of polymer based on surface analysis.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Yelena G. Gakh, Ph.D. whose telephone number is (571) 272-1257. The examiner can normally be reached on 9:30 am - 6:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vickie Y. Kim can be reached on (571) 272-0579. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Yelena G. Gakh/  
Primary Examiner, Art Unit 1797

8/28/2010